## NOTES AND REVIEWS

SVERRE PETTERSSEN. *Weather Analysis and Forecasting.* New York (McGraw-Hill Book Co.), 1940. 505 pp., 249 figs.

The purpose of this book is to assemble the practical methods now available (most of them developed comparatively recently) for forecasting weather on the basis of physical principles. A general knowledge of meteorology is presupposed, and only those aspects of meteorology are treated which experience has shown to be directly applicable to actual forecasting. The book embodies the original theoretical investigations and the accumulated experience of the author in synoptic meteorology over a long period of years. The author's methods are distinguished by the introduction of precise formulations of synoptic concepts, in terms of quantities that can be measured in ordinary meteorological observation.

The first chapter contains a brief treatment of 17 different quantities in terms of which the physical characteristics of air masses may be described. It is followed by a chapter on the theory of atmospheric stability, convective phenomena, and fog, and the uses of various thermodynamic diagrams. Chapter III discusses the source regions, production, classification, and transformation of air masses. Two chapters are then devoted to the fundamental dynamical equations of motion, the gradient wind, kinematic analysis, frontogenesis, and the characteristic phenomena of fronts, followed by a chapter on waves and the wave theory of cyclones. Chapter VIII is on isentropic analysis, and was written by Jerome Namias. Two chapters on the kinematic forecasting of the displacements of pressure systems, fronts, and air masses, and the forecasting of deepening and filling, are followed by the concluding chapter on the actual technique of analysis and forecasting, with several examples.

EDMUND SCHULMAN. A Bibliography of Tree-Ring Analysis. *Tree-Ring Bulletin* (University of Arizona, Tucson), Vol. 6, No. 4, April 1940. This entire issue of the *Tree-Ring Bulletin* is devoted to a 12-page bibliography comprising 412 titles on tree-ring analysis.

## METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR AUGUST 1940

[Climate and Crop Weather Division, J. B. KINCER in charge]

### AEROLOGICAL OBSERVATIONS

By EARL C. THOM

The mean surface temperatures during August (Chart I) were above normal over most of the United States; temperatures were slightly below normal, however, over considerable of the western part of the Mississippi River Valley area, and a small area in northeastern Texas had temperatures from 2° to 3° (F.) below normal. Temperatures were also below normal over the northern Atlantic States, with temperatures about 3° below normal in New Jersey and eastern New York. The warmest area for the month, relative to the normal, was Montana, western Wyoming, northern Utah, and northern Nevada with mean temperatures about 5° above normal in most of this area.

At the 1,500-meter level the direction of the resultant winds for the month (chart VIII) was considerably to the north of normal (clockwise turning) over the Atlantic Coast States and also over eastern Texas. The direction of the resultants for the month had the opposite turning over the Great Lakes and the east central states. The same general diversion from normal in the direction of the resultant winds for August occurred at the 3,000-meter level as at the 1,500-meter level, except that the shift of direction to northward was more pronounced over eastern Texas and extended over Oklahoma. Based on data for the small number of stations for which 5 a. m. normal records are at hand, the direction of the resultant wind for the month at 5 p. m. was south of the corresponding 5 a. m. normal over the eastern half of the country and over the extreme northwest with the opposite shift occurring over the remainder of western United States.

The 5 a. m. resultant velocity for August was in general below the normal resultant velocity over the United States at both the 1,500-meter and the 3,000-meter levels. The resultant velocity was about 3 meters per second below normal at the 1,500-meter level along the northern Atlantic coast and at Fargo, N. Dak., while the corresponding velocity was slightly over 4 meters per second below normal for the 3,000-meter level at Fargo and Sault Ste. Marie. At the 5,000-meter level the 5 p. m. resultant normal was considerably above the corresponding 5 a. m. velocity over the South Central States and was considerably below this normal over the Northeast and North Central States.

Again in August the areas having a decided shift in direction of the resultant winds from normal, at both the 1,500-meter and the 3,000-meter levels, agree well with the areas having corresponding surface temperature departures for the month.

At the 1,500-meter level the direction of the 5 p. m. resultant for the month was south of the corresponding 5 a. m. resultant (counterclockwise turning) over a large part of the United States. The opposite shift in resultant wind direction at this level occurred over the Great Lakes and part of the North Atlantic States, over part of the Southeastern States and over most of the extreme western and extreme southwestern portions of the country. At the 3,000-meter level the shift of the resultant wind to the northward from 5 a. m. to 5 p. m. was noted over larger areas, this shift having occurred over the Gulf coast, southern Atlantic coast, part of the east Central States, over the Pacific coast and most of the Southwest and West Central States.

The changes in resultant velocity at 5 p. m. from those at 5 a. m. were well distributed at both the 1,500-meter and the 3,000-meter levels. At the 1,500-meter level, however, the West Central, the Central, and the Southeastern States all showed lower resultant velocities at 5 p. m. than at 5 a. m., the velocity departures in this area amounting to a decrease of Beaufort force one or two.

It is of interest to note that at Las Vegas, Nev., the pilot balloon observations attained a height of 18 kilometers or over on 16 days during the month and that the resultant wind, based on those observations was 118° (ESE), 2.0 meters per second for that level.

The upper air wind data discussed above are shown in table II and in charts VIII to XI.

At all levels from 3,000 meters up to at least 17,000 meters over the United States (table I) the highest mean monthly pressures for the month of August occurred over the extreme southwestern part of the country; the maximum occurred at Phoenix at most of these levels. At